
Space Weather Forecast

Issued on Monday, 17 April 2023 at 00:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate-class X-ray flares (R1-R2 Minor-Moderate radio blackouts), and a slight chance of Strong-Class flares (R3 strong radio blackouts) throughout. Increasing chance of Minor Geomagnetic Storms on 19-20 Apr with a slight chance of Strong Geomagnetic Storms on the 20 Apr due to possible CME (coronal mass ejection) arrival.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only Common-class flares observed. There are 11 classified sunspot regions on the visible disc with four of these considered to be notable. Two in the southeast quadrant, neighboring each other appear to be passing through phases of strengthening and weakening. A large region in the northeast has stabilised after earlier rapid development. A further region just in the southwest quadrant also appears to have stabilised. All these regions carry relatively complex magnetic configurations and are the source of much of the recent Common-class flares. The remaining regions tend to be simple or are following a slow evolution.

Three notable CMEs (coronal mass ejections) have been analysed for potential Earth impacts over the last 24 hours. A large eruption observed in the northern hemisphere approximately 15/1100UTC has been analysed and may glance the Earth on 19 Apr. An eruption from the southwest at 15/2250UTC was assessed and appears to be directed away from Earth. The third eruption from the northwest disk around 15/2330UTC produced a near full halo with an estimated arrival sometime on day 4 (20 Apr). No other Earth directed CMEs detected in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has been at background levels throughout the period. Total magnetic field strength has been weak, with the important north-south component also varying weakly. Geomagnetic activity was Quiet throughout the period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, with a likelihood of Moderate activity through the next four days. There is a slight chance of isolated Strong activity.

Solar Wind / Geomagnetic Activity: Geomagnetic activity is forecast to be mainly Quiet to Unsettled through days 1 and 2 (17, 18 Apr) with solar winds at background levels. Into days 3 and 4 (19, 20 Apr) There is an increasing risk of Active or G1/Minor Storm intervals, with a slight chance of G2-G3/Moderate-Strong storm intervals by day 4 (20 Apr) due to forecast CME arrival.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected and should
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remain at background levels, although there is a slight chance of a greater than S1 event as some of the more complex active regions transit towards the western solar hemisphere, where they are more likely to connect with the Earth.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	1	20	40
Strong	G3	No	1	1	1	10
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)